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. EXAMINER
DARNO, PATRICK A

ART UNIT	PAPER NUMBER
2163	

DATE MAILED: 10/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
	10/787,320	DEKONING ET AL.
Office Action Summary	Examiner	Art Unit	
	Patrick A. Darno	2163	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>27 February 2004</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-30</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-30</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on <u>27 February 2004</u> is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date <u>10022006 and 05272004</u>.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

1.   Claims 1-30 are pending in this Office Action.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2.   Claims 3-4, 13-22, 24-25, and 28-29 are rejected under 35 U.S.C. 112, first paragraph, as

failing to comply with the enablement requirement. The claim(s) contains subject matter which

was not described in the specification in such a way as to enable one skilled in the art to which it

pertains, or with which it is most nearly connected, to make and/or use the invention.

Specifically, the claims cited above all contain what is referred to as an 'intermediate

snapshot'. The only reference made in the specification to an 'intermediate snapshot' is located

on page 4 in the section title "Summary of the Invention". However, this is simply reciting

language found in Applicant's claim 15. The Examiner was not able to find anything in the

Applicant's specification that would enable one of ordinary skill in the art to make and use an

'intermediate snapshot'.

In order to present a reasonable art rejection, the Examiner assumes that an 'intermediate

snapshot' is simply a snapshot of a portion of a data store. If this assumption is true, an

'intermediate snapshot' is really no different from a regular snapshot. However, since the

Applicant has not given a specific definition of an 'intermediate snapshot' and has not set forth

any clear definition of the use of an 'intermediate snapshot', the Examiner has decided to reject

all claims directed to an 'intermediate snapshot' under 35 U.S.C. 112, first paragraph, for failing

to enable one of ordinary skill in the art to make and use an 'intermediate snapshot'.

In order to overcome this rejection, the Applicant must either 1) cancel all claims directed

to an 'intermediate snapshot', 2) point out the sections of the Applicant's specification which

would enable one of ordinary skill in the art to make and use an 'intermediate snapshot', or 3)

agree with the Examiner's interpretation of 'intermediate snapshot' as simply being a snapshot of

a portion of a data store, and then amend the claims accordingly. Any of the above choices

would rectify the deficiency, but at least one is required in order to overcome this rejection.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or
> any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and
> requirements of this title.

3.   Claims 1-30 are rejected under 35 U.S.C. 101 because the claims are directed to non-

statutory subject matter.

With respect to claim 1, the invention as claimed does not provide a conclusionary step.

Without a conclusionary step, the invention, as claimed, appears to simply be an abstract idea

performing a few steps that do not appear to be related for any specific purpose. Since invention,

as claimed, appear to be directed to an abstract idea, the claims are not covered by the statutory

categories of patentable subject matter set forth in 35 U.S.C. 101.

However, an abstract idea is categorized as one of three judicially created exceptions to

patentable subject matter (the three exceptions are Laws of Nature, Natural Phenomena, and

Abstract Ideas). The courts have concluded that in order to patent one of the three judicial

exceptions to the statutory categories of invention the applicant must show that the claimed

invention has a practical, real-world application that produces a useful, concrete, and tangible

result *(State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02).*

In order to overcome the rejection given above, claim 1 must be amended in order to

recite a final, conclusionary step, which sets forth a practical application yielding a useful,

concrete, and tangible result. Appropriate correction is required.

Claims 2-14 and 23-30 are rejected because they either inherit or contain the deficiencies

of claim 1. All independent claims are required to be amended in the same manner as claim 1.

The Examiner does not believe that any dependent claims currently resolve the deficiencies

found in independent claims 1, 8, 23, and 27.

With respect to claims 15, the claim recites a system. However, the claims are not

actually limited to any physical articles or objects. It appears that the Applicant is seeking to

patent particular programmed functionality of the components rather than the components

themselves. Specifically, the claim limitations of 'a virtualization layer...', 'a snapshot layer',

and 'an overall snapshot object' all appear to be directed to implementations of software. Since

the limitations are indeed directed to programmed functionality and not the components of an

apparatus themselves, the claimed programmed functionality must have a final result achieved,

which is useful, concrete, and tangible. The claim needs to be amended in the same manner as

claim 1.

Claims 16-22 are rejected because they contain the deficiencies of claim 15.

With respect to claim 27, the claim is directed to computer readable medium 'containing'

program code. But, it appears that the computer readable medium that is claimed by the

Applicant is not limited to physical articles or objects, which are structurally and functionally

interrelated to the program in such a manner that would enable the program to act as a computer

component and realize any functionality. In paragraph [0175] of the Applicant states that the

computer readable medium for which the computer program of the invention can be embodied

includes a carrier wave from the Internet or other propagation medium. However, this type of

communication medium or transmission medium is not limited to media which meet the criteria

set forth above.

In order to overcome this rejection, the Applicant must either 1) amend the claims in such

a fashion that eliminates the possibility that 'a carrier wave from the Internet or other

propagation medium' can be included as a computer readable medium, or 2) make a clear

disavowal, on the record, of all embodiments that may include 'a carrier wave from the Internet

or other propagation medium' to be an appropriate computer readable medium. Either of the

above choices would rectify the deficiency, but at least one is required in order to overcome this

rejection.

Claims 28-30 are rejected because they contain the deficiencies of claim 27.

Claim Rejections - 35 USC § 102

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4.   Claims 1-3, 5-6, 8-13, 15-24, 26-28, and 30 are rejected under 35 U.S.C. 102(e) as being

anticipated by U.S. Patent Number 6,981,114 issued to Weibao Wu et al. (hereinafter "Wu").

Claim 1:

Wu discloses a method comprising:

identifying a source volume containing stored data, wherein the source volume is a

virtual volume comprising objects defining a mapping to data in at least one storage device, and

wherein the objects are distributed across more than one processor in a virtualization layer

between at least one host and the at least one storage device *(Wu: column 4, lines 27-35 and column 4,*

lines 39-43 and Figs. 1 and 2; Note specifically that volume manager can 'virtualize physical storage'. Furthermore,

the users (Fig. 1, 108A-108D) are able to access the data stored on the physical devices by the virtualization layer

that is provided by mapping the physical devices into virtual volume.);

generating a snapshot of the source volume that is a point-in-time copy containing state

information about a state of the source volume when the snapshot is generated *(Wu: column 5, lines*

46-51); and

distributing the snapshot of the source volume across the more than one processor in the

virtualization layer *(Wu: column 4, lines 27-55; The reference cited clearly shows that a volume spans many*

storage devices. The plurality of storage devices are mapped to a virtual volume through implementation of a

virtualization layer that makes the plurality of physical storage devices appear as one virtual volume. This virtual

volume is distributed across a plurality of storage devices as shown in Fig. 1. Furthermore, a plurality of servers,

which include processors, are distributed across the storage devices, wherein each server can access the provided

storage devices. Finally, a snapshot is simply a replication of a virtual volume, or at least a portion of a volume. So,

it follows that the snapshot is also distributed across multiple storage devices and is also distributed across a

plurality of servers or processors. See Figs. 1 and 2 as well as the cited references for further clarification.).

Claim 2:

Wu discloses all the elements of claim 1, as noted above, and Wu further discloses wherein the method of the snapshot of the source volume does not affect the availability of the source volume to the at least one host *(Wu: column 5, lines 5-12 and column 6, lines 58-62; This reference clearly shows a snapshot being created while the volume it is being created form is still being accessed.).*

Claim 3:

Wu discloses all the elements of claim 1, as noted above, and Wu further discloses wherein the generating further includes:

for each processor that contains objects in the virtual volume, creating an intermediate snapshot of a portion of the virtual volume corresponding to objects contained on the processor *(Wu: column 4, lines 51-55 and Fig. 4; The first reference clearly shows creating a snapshot of only a portion of a virtual volume. The second reference clearly shows an intermediate snapshot, which is broadly interpreted as a snapshot in between two other snapshots.).*

Claim 5:

Wu discloses all the elements of claim 1, as noted above, and Wu further discloses a method comprising:

creating a change log corresponding to the snapshot *(Wu: column 6, lines 14-25)*; and

storing in the change log changes to the source volume made after the snapshot is generated *(Wu: column 6, lines 14-18).*

Claim 6:

Wu discloses all the elements of claim 5, as noted above, and Wu further discloses wherein the change log is a copy on write (COW) change log *(Wu: column 4, lines 63-65).*

Claim 8:

Wu discloses a method of comprising:

identifying a source volume containing stored data, wherein the source volume is a

virtual volume comprising objects defining a mapping to data in at least one storage device, and

wherein the objects are distributed across more than one processor in a virtualization layer

between at least one host and the at least one storage device *(Wu: column 4, lines 27-35 and column 4,*

lines 39-43 and Figs. 1 and 2; Note specifically that volume manager can 'virtualize physical storage'. Furthermore,

the users (Fig. 1, 108A-108D) are able to access the data stored on the physical devices by the virtualization layer

that is provided by mapping the physical devices into virtual volume.);

specifying a change log volume corresponding to the source volume *(Wu: column 7, lines 26-*

29; If the system actually chooses the modification log to use, the modification must have been chosen or specified in

some manner.);

generating a snapshot of the source volume that is a point-in-time copy containing state

information about a state of the source volume when the snapshot is generated *(Wu: column 5, lines*

46-51); and

storing, in the change log volume, changes made to the source volume after the snapshot

is generated *(Wu: column 6, lines 14-18)*.

Claim 9:

The method of claim 8, further comprising:

distributing the snapshot of the source volume across the more than one processor in the

virtualization layer *(Wu: column 4, lines 27-55; The reference cited clearly shows that a volume spans many*

storage devices. The plurality of storage devices are mapped to a virtual volume through implementation of a

virtualization layer that makes the plurality of physical storage devices appear as one virtual volume. This virtual

volume is distributed across a plurality of storage devices as shown in Fig. 1. Furthermore, a plurality of servers,

which include processors, are distributed across the storage devices, wherein each server can access the provided

storage devices. Finally, a snapshot is simply a replication of a virtual volume, or at least a portion of a volume. So,

it follows that the snapshot is also distributed across multiple storage devices and is also distributed across a

plurality of servers or processors. See Figs. 1 and 2 as well as the cited references for further clarification.)); and

> distributing the change log volume across the more than one processor in the

virtualization layer *(Wu: column 4, lines 27-55; All storage is virtualized and distributed in the manner as*

explained above.).

Claim 10:

> Wu discloses all the elements of claim 8, as noted above, and Wu further discloses

further comprising:

> receiving a request for data stored in the source volume *(Wu: column 9, lines 45-61)*;

> determining from the change log volume, whether the requested data has changed since

the snapshot was generated *(Wu: column 6, 14-18)*;

> retrieving the requested data from the change log volume, when it is determined that the

requested data has changed since the snapshot was generated *(Wu: column 9, lines 45-61; When it is*

determined that the snapshot has changed, a new one is created using the change logs. If no change has been made

to the snapshot, there is no need to invoke the change logs. This reference clearly shows retrieving data from a

change (modification) log in order to retrieve the most recent modifications to a snapshot.); and

> retrieving the requested data from the source volume, when it is determined that the

requested data has not changed since the snapshot was generated *(Wu: column 4, lines 40-43 and*

column 9, lines 45-61; The only time change logs are invoked in the Wu reference is when modifications have been

made to a storage volume or snapshot. At all other times, the primary (source) volumes or snapshots are accessed.).

Claim 11:

Wu discloses all the elements of claim 10, as noted above, and Wu further discloses a

method comprising:

retrieving the requested data from the snapshot, when it is determined that the requested

data has not changed since the snapshot was generated *(Wu: column 4, lines 40-43 and column 9, lines*

45-61; The only time change logs are invoked in the Wu reference is when modifications have been made to a storage

volume or snapshot. At all other times, the primary (source) volumes or snapshots are accessed.).

Claim 12:

Wu discloses all the elements of claim 8, as noted above, and Wu further discloses·

wherein the generating of the snapshot of the source volume does not affect the availability of

the source volume to the at least one host *(Wu: column 5, lines 5-12 and column 6, lines 58-62; This*

reference clearly shows a snapshot being created while the volume it is being created form is still being accessed.).

Claim 13:

Wu discloses all the elements of claim 8, as noted above, and Wu further discloses

wherein the generating further includes:

for each processor that contains objects in the virtual volume, creating an intermediate

snapshot of a portion of the virtual volume corresponding to objects contained on the processor

(Wu: column 4, lines 51-55 and Fig. 4; The first reference clearly shows creating a snapshot of only·a portion of a

virtual volume. The second reference clearly shows an intermediate snapshot, which is broadly interpreted as a

snapshot in between two other snapshots.).

Claim 15:

Wu discloses a system comprising:

a plurality of storage devices storing data corresponding to a host *(Wu: Fig. 1, 104A...104n)*;

a virtualization layer between the host and the plurality of storage devices, the virtualization layer comprising objects defining a mapping to data in the plurality of storage devices *(Wu: column 4, lines 27-32)*; and

a snapshot layer *(Wu: Fig. 2, 240)* between the host and the virtualization layer, the snapshot layer comprising:

an intermediate snapshot of each object in the virtualization layer, the intermediate snapshot having references to (1) the object in the virtualization layer, (2) an intermediate point-in-time copy of the object, and (3) a change log corresponding to the intermediate point-in-time copy *(Wu: column 4, lines 61-67 and column 5, lines 46-51 and column 6, lines 14-25)*, and

an overall snapshot object containing a reference to each intermediate snapshot *(Wu: column 6, lines 38-44; Note specifically that the 'snapshot manger' (overall snapshot object) maintains a history of each snapshot created and can identify (reference) each snapshot.)*.

Claim 16:

Wu discloses all the elements of claim 15, as noted above, and Wu further discloses wherein each intermediate point-in-time copy contains state information about a state of the corresponding object in the virtualization layer when the snapshot layer is generated *(Wu: column 9, lines 11-16; Since the system is capable of restoring a snapshot to a desired 'state', the snapshot point-in-time*

copies must have some kind of state information stored with them in order for the system to restore them to the desired 'state'.).

Claim 17:

Wu discloses a claim 15, as noted above, and Wu further discloses wherein each change log stores changes made to the corresponding intermediate point-in-time copy after the snapshot layer is generated *(Wu: column 6, lines 14-18).*

Claim 18:

Wu discloses all the elements of claim 15, as noted above, and Wu further discloses wherein the virtualization layer has multiple processors and the objects defining the mapping to data in the plurality of storage devices are distributed across the multiple processors *(Wu: column 4, lines 27-55; See the rejection of claim 1 for further clarification/explanation of the cited reference.).*

Claim 19:

Wu discloses all the elements of claim 15, as noted above, and Wu further discloses wherein the virtualization layer has multiple processors and the intermediate snapshot objects are distributed across the multiple processors *(Wu: column 4, lines 27-55; See the rejection of claim 1 for further clarification/explanation of the cited reference.).*

Claim 20:

Wu discloses all the elements of claim 15, as noted above, and Wu further discloses a system further comprising:

an interface enabling the host to view a point-in-time representation of the data by accessing the overall snapshot object *(Wu: column 4, lines 40-43 and column 6, lines 38-44).*

Claim 21:

Wu discloses all the elements of claim 15, as noted above, and Wu further discloses a

system comprising:

an interface enabling the host to specify when the snapshot layer is created *(Wu: column 4,*

lines 40-43 and column 6, lines 48-55; The first reference discloses user applications used to perform operations

carried out by the Wu reference. The second reference shows that the creation of snapshots (snapshot layer) can be

set at different frequencies. There must be some means provided in the user applications that allow for the user to

change set the frequency of snapshot creation and therefore allowing the user of the host computer to specify when a

snapshot is created.).

Claim 22:

Wu discloses all the elements of claim 15, as noted above, Wu further discloses wherein

the snapshot layer is created on a periodic basis *(column 6, lines 48-55; Note the reference shows the*

snapshots can be generated daily or weekly.).

Claim 23:

Claim 23 is rejected under the same reasons set forth in the rejection of claim 1.

Claim 24:

Claim 24 is rejected under the same reasons set forth in the rejection of claim 3.

Claim 26:

Claim 26 is rejected under the same reasons set forth in the rejection of claim 5.

Claim 27:

Claim 27 is rejected under the same reasons set forth in the rejection of claim 1.

Claim 28:

Claim 28 is rejected under the same reasons set forth in the rejection of claim 3.

Claim 30:

Claim 30 is rejected under the same reasons set forth in the rejection of claim 5.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

5.   Claims 4, 14, 25, and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Wu and further in view of U.S. Patent Application Publication Number 2003/0191911 issued to

Donald Kleinschnitz, JR. et al. (hereinafter "Kleinschnitz").

Claim 4:

Wu discloses all the elements of claim 3, as noted above, but Wu does not explicitly

disclose a method wherein the generating further includes:

combining intermediate snapshots from each processor to generate the snapshot of the

source volume.

However, Kleinschnitz discloses a method wherein the generating further includes:

combining intermediate snapshots from each processor to generate the snapshot of the

source volume *(Kleinschnitz: paragraph [0003], lines 13-18 and paragraph [0071], lines 7-15; Note specifically*

in paragraph [0071] that an incremental image (intermediate snapshot) is merged (combined) with an existing

snapshot. This clearly shows the combining of multiple snapshots. Further note that snapshots for multiple clients

are stored in an image database (paragraph [0067]). It is clear to see that Kleinschnitz discloses all the elements of

Applicant's claim. Furthermore, the Kleinschnitz reference also discloses the functionality needed to combine

intermediate snapshots.).

It would have been obvious to one of ordinary skill in the art at the time the invention

was made to modify the teachings of Wu with the teachings of Kleinschnitz noted above for the

purpose of combining intermediate snapshots *(Kleinschnitz: paragraph [0003], lines 13-18 and paragraph*

[0071], lines 7-15). The skilled artisan would have been motivated to improve the teachings of Wu

per the above such that by merging or combining the snapshot, a complete and more recent

snapshot image can be created and stored in the image database as a precaution so that the

system can be restored in the event of a hard drive failure, virus corruption, or some other

disaster *(Kleinschnitz: paragraph [0071], 12-15 and paragraph [0004], lines 1-3).*

Claim 14:

Claim 14 is rejected under the same reasons set forth in the rejection of claim 4.

Claim 25:

Claim 25 is rejected under the same reasons set forth in the rejection of claim 4.

Claim 29:

Claim 29 is rejected under the same reasons set forth in the rejection of claim 4.

6.   Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Wu and further in

view of U.S. Patent Number 6,173,293 issued to Chandramohn A. Thekkath et al. (hereinafter

"Thekkath").

Claim 7:

Wu discloses all the elements of claim 5, as noted above, but Wu does not explicitly

disclose wherein snapshot cannot be changed after it is generated ().

However, Thekkath discloses wherein snapshot cannot be changed after it is generated

(Thekkath: column 13, lines 8-14). It would have been obvious to one of ordinary skill in the art at the

time the invention was made to modify the teachings of Wu with the teachings of Thekkath

noted above for the purpose of not allowing a snapshot to be changed after it is generated

(Thekkath: column 13, lines 8-14). The skilled artisan would have motivated to improve the teachings

of Wu per the above such that access to would be controlled so that any user's view of any file at

any one time is consistent any other user's view *(Thekkath: column 3, lines 33-37)*.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Patrick A. Darno whose telephone number is (571) 272-0788.

The examiner can normally be reached on Monday - Friday, 9:00 am - 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Don Wong can be reached on (571) 272-1834. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

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like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Patrick A. Darno
Examiner
Art Unit 2163

PAD

DON WONG
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100